DOCUMENT RESUME

ED 109 661 CS 002 069

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TITLE A Taped Echoic Response Method with Segmented Print for Poor Readers in Secondary School.
PUB DATE Jun 75
NOTE 21p.; Unpublished study prepared at the City College of New York and Theodore Roosevelt High School, Bronx, N.Y.

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS *Decoding (Reading); Instructional Materials; *Oral Reading; *Reading Comprehension; *Reading Research; *Remedial Reading; Secondary Education

ABSTRACT

This document describes a pilot study of a corrective reading procedure using audio-taped echoic responses and reading material; polysyllabic words were spatially segmented to provide positional and marker grapheme clues to variant spelling-to-sound correspondences. Three groups of tenth graders four or more years below grade level in oral reading and comprehension were compared for gains according to the Gilmore Oral Reading Test and the Metropolitan Reading Test. Subjects receiving a combination of taped echoic responses and segmented print made a mean gain of 8.7 months in oral reading; those receiving only the taped echoic treatment gained 6 months; and a control group in a remedial program using neither treatment gained 1.6 months in a semester. Differences among group gains were significant, although mean gain differences for reading comprehension were not significant. From the data it was concluded that a remedial reading program combining a taped echoic response method using segmented print material can be effective in improving oral reading. (Author/TS)

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ED109663

A TAPED ECHOIC RESPONSE METHOD WITH SEGMENTED PRINT FOR POOR READERS IN SECONDARY SCHOOL

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CS 002 069

ABSTRACT

Describes a pilot study of a corrective reading procedure using audio-taped echoic responses and reading material in which polysyllabic words were spatially segmented to provide positional and marker grapheme clues to variant spelling-to-sound correspondences. Three groups of tenth graders four or more years below grade in oral reading and comprehension were compared for gains according to the Gilmore Oral Reading Test and the Metropolitan Reading Test. Ss receiving a combination of taped echoic responses and segmented print made a mean gain of 8.7 months in oral reading; those receiving only the taped echoic treatment gained six months, and a control group in a remedial program using neither treatment gained 1.6 months in a semester. Differences among group gains were significant ($p < .02$). Mean gain differences for reading comprehension were non-significant, although the combined treatment group gained five months, the echoic response only group made no gains, and the control group gained six months. Concludes that replications and further investigations of the combined treatment for poor decoders in secondary schools are warranted.

INTRODUCTION

One of the most pressing areas of concern for many secondary schools today is the retarded reader - the pupil who may be reading on as high as a sixth grade level, but whose further progress is so slow that he is unable to cope with the textbooks and reference materials appropriate for a respectable high school education. The urgency of the problem stems from compelling evidence that inadequate reading ability is a prime factor in academic failure, truancy, disruptive school behavior and early drop-out, to say nothing of lowered teacher morale and a diminished confidence in the educational system by the public at large.

To provide more effective remediation it may be helpful to differentiate instructional emphases for three groups of poor readers: (1) pupils for whom English is a secondary language, (2) pupils who have comprehension difficulties, but who have a relatively adequate mastery of the decoding skills of word-identification and fluent oral reading, and (3) pupils whose decoding ability is on so elementary a level that comprehension is impaired. It is with this third group that the present pilot study was concerned.

A major source of decoding difficulty for these students is found in the polysyllabic words that occur with ever-increasing frequency in the reading materials for each successive grade. Polysyllables often block pupils who may have sizeable sight vocabularies and a considerable amount of

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*The study was partially supported by a grant from the Learning Cooperative of the New York City Board of Education and by Title I ESEA funds. Appreciative acknowledgements are made to Ms. Helen Latner, Alba Isidori, Meryl Sachs, Andrea Rockower and Mr. Anthony Francentese for invaluable assistance.

phonic knowledge, and even when the words are in the reader's speaking or listening vocabulary (Rogers, 1937; Anderson and Fairbanks, 1937; Triggs, 1946; Bolling, 1958).

Another important decoding deficit is the inability to reconstruct the language of print, either orally or silently, into fluent speech with appropriate rhythm and intonation (Dearborn, Johnson and Carmichael, 1949; Lloyd, 1964; Lefevre, 1968). Although this deficiency may be related to inadequate word-identification ability or sentence sense, the poor decoder may also have persisting habits of word-by-word reading, frequent repetitions and disregard of syntactical and typographical signals for phrasing, intonation and voice terminals. As Lefevre (1968) notes, a primary and basic requirement for comprehension is the ability to read the "patterns and tunes" of English sentences from the printed page.

At least three sets of factors seem to impede conventional efforts at overcoming decoding deficiencies in the secondary grades. One is the apparent inappropriateness of some strategies commonly taught for decoding polysyllables. To help pupils teachers usually present or develop rules for syllabic and structural analysis (Dolch, 1947; Betts, 1957; Durkin, 1962; Heilman, 1969). Unfortunately, syllabication rules for word-identification purposes (as opposed to their use for end-of-line divisions by writers and typesetters) seem to have limited or even doubtful value for many pupils (Wardhaugh, 1966; Glass, 1967). To a large degree the unreliability of some rules and the cumbersomeness of application of others are sources of confusion and frustration (Clymer, 1963; Schell, 1967). Wardhaugh (1966) points out that when written English words are divided into "syllables," the division points may have little or nothing to do with phonological facts. In commenting on the customary recommendations for word

divisions, he writes:

> ... one can only wonder that children ever succeed in reading at all and not be surprised that certain children are reported to have great difficulty in synthesizing sounds and syllables. The really surprising thing is that so many children actually do succeed, not that so few do not. (p. 787).

Another factor that may be impeding pupils' progress in decoding is a widely prevalent de-emphasis on instruction in oral reading beyond the primary grades. Although some reading authorities view oral reading as a valuable means of developing word-identification and oral reading skills for poor readers at any level (McKee, 1948; Durrell, 1956), there is a fear among others that extensive oral reading will result in undesirable habits in silent reading, lack of attention to meaning, embarrassment for poor readers and boredom for the listeners (Judd and Buswell, 1922; Edwards, 1958; Olson and Ames, 1972). Undoubtedly justified is the consensual condemnation of oral reading in "round-robin" fashion. As a result of such strictures word-analysis practice in the middle and upper grades has become limited almost totally to written exercises in workbooks (Deasy, 1960), and oral reading instruction has been relegated to an incidental status, occurring mainly in situations that require the pupil to communicate from the printed page (DeBoer and Dallman, 1960).

A third set of problems stems from the behavioral and attitudinal characteristics often encountered in poor readers, especially among the "culturally deprived." Attempts to provide sequential, structured instruction often founder in the face of irregular school and class attendance, a high degree of distractibility in group work, a diminished respect for authority as such, and a value system that has a low regard for conventional curriculum offerings and methodologies (Peters, 1962).

The present studied tried to contend with these factors by means of an echoic response reading program using master tapes to serve as models for oral reading, cassette recorders for pupils' oral reading, and high interest reading selections in which polysyllabic words were spatially divided according to principles derived from linguistic research.

REVIEW OF RELATED LITERATURE

The use of segmented presentation of polysyllables to teach reading extends back many years (Hart, 1570; Webster, 1790; Pitman, 1885). The bases for segmentation were not specified, however, and seem to have been determined subjectively. Evaluations of segmented print as an instructional procedure are also unavailable, either because none was made or because segmentation was but one feature in a total "system" and was not assessed as a distinct independent variable.

Rettke (1958) syllabicated the words on the Wide Range Reading Test according to dictionary entry word divisions and found that poor readers in grades 4, 5 and 6 performed better with "syllabified print" than with the published form. Simon (1971) found that retarded readers in grades 7, 8 and 9 demonstrated better oral reading, word knowledge and reading comprehension on standardized tests prepared in segmented print than in non-segmented versions. Divisions of polysyllables were based on "graphemic environments" that included positional and marker grapheme clues to variant spelling-to-sound correspondences within each segment.

The reliability of phonic and syllabication rules has been studied by Clymer (1963), Bailey (1967), Emans (1967) and Burmeister (1968) and they conclude that (1) many of the generalizations presented to teachers and pupils are unreliable or too vague to be of use, (2) the ad hoc nature

of some generalizations, with diminished utility in successive grade levels, indicates that some rules have to be "unlearned" in the upper grades; and (3) there is often a confusion between reading rules and those for spelling or end-of line divisions.

Part of the difficulty in formulating useful rules for word-identification stems from the complex nature of the English orthography, a complexity leading some reading authorities to describe it as chaotic, inconsistent and illogical (Hildreth, 1968; Pitman, 1969). Investigations by Hanna et al (1966), Weir (1964), Venezky (1965) and Weir and Venezky (1965), however, indicate that the English orthography, far from being merely a defective alphabetic system, is a lawful, albeit complex system of spelling-to-sound correspondences. Hanna found that by considering position in a syllable and stress as well as direct phoneme-grapheme correspondences, the over-all consistency of one grapheme representing a given phoneme was slightly over 84 per cent. Venezky (1965) provides us with a comprehensive description of the determinants of English spelling-sound correspondences. Basing his findings on an analysis of a 20,000 word corpus, he found that the regularity and predictability of English spelling-to-sound correspondences become apparent only by considering not only such graphemic features as position in a syllable and adjacent and non-adjacent "marker" graphemes, but morphophonemic structure and syntax as well.

Several investigators have studied the effect of echoic responses as an instructional approach to reading. Heckelman (1969) reported that retarded readers in grades 7 through 10 made a mean gain of 1.9 years in reading comprehension in six weeks of instruction with a "neurological impress" method in which the S and the teacher read the same material aloud

simultaneously. Hollingsworth (1970) used a modified version of the "impress" method with average readers in the fourth grade. Ss listened to taped stories broadcast on a wireless system , simultaneously following the text and reading aloud. The "impress method was not significantly better on measures of vocabulary, comprehension, accuracy or speed. Hollingsworth proposed that the method might be effective only with retarded readers and that the teacher had to be personally involved. Neville (1968) compared the effects of echoic and oral reading responses before silent reading in the first grade. Echoic responses resulted in better fluency, but no difference in comprehension was noted.

HYPOTHESES AND DESIGN OF THE STUDY

The design of the study was directed by the following general hypothesis: a taped echoic response method combined with a technique of polysyllabic segmentation would improve the reading ability of poor readers in secondary schools.

Specifically it was hypothesized that in a comparison of three groups of poor decoders, (a) a group receiving both an echoic response method of instruction combined with segmented print materials (TERM-SP), (b) a group receiving a taped echoic response treatment in non-segmented materials (TERM-NSP), and (c) a group receiving neither treatment, the TERM-SP group would make the greatest gains in (1) oral reading and (2) reading comprehension.

The hypotheses are specific to tenth grade pupils in a Federally reading remediation program who were four or more years below grade

placement in both oral reading and reading comprehension.

Subjects

The Ss for the study were selected from the tenth grade of an inner-city high school with predominantly a Black and Hispanic population. Pupils who had scored below 7.0 on the Metropolitan Reading Test routinely administered as part of a Title I ESEA funded Skills Remediation in Reading program were screened with the Reading section of the Wide Range Achievement Test to identify those who were below 7.0 in word-identification. A group of 220 S's were so identified. The Gilmore Oral Reading Test, Form B was administered to these Ss in random order until a sample of 105 S's with an oral reading grade of equivalent below 6.5 was found.

S's were randomly assigned to three treatment groups as follows: 45 S's in the TERM-SP group, 30 S's in the TERM-NSP group and 30 S's in the control group receiving neither treatment (C). Because of transfers and absences, however, complete test data were finally available for 66 S's. Reading levels of the S's are summarized in Table I.

TABLE I

MEAN GRADE EQUIVALENTS AND STANDARD DEVIATIONS:

ORAL READING AND TOTAL READING COMPREHENSION

Group	N	Oral Reading ($\bar{X}$)	(S.D)	Total Reading ($\bar{X}$)	S.D.
TERM-SP	25	4.6	1.1	4.7	1.3
TERM-NSP	19	5.0	1.1	4.8	1.3
Control	22	4.6	.8	4.9	1.0
	66				

Comparisons of means for both oral reading and for total reading comprehension with one-way analyses of variance showed that differences were non-significant at the .05 level.

Selection and Preparation of Materials

Materials for the TERM-SP and TERM-NSP groups were selected from from among those used in the Skills Remediation in Reading program and included such commonly used materials as SRA Laboratory and Reading for Understanding kits, Be a Better Reader, Scope, Scholastic Magazines, etc. Selections ranging in difficulty from sixth to eighth grade reading levels were assembled and presented to a committee of pupils to choose those that seemed particularly interesting. A total of 90 selections were so identified and were typed in segmented print form, spatially separating the appropriate word divisions of polysyllables. While space limitations do not permit a complete description of the rationale and basis for the segmentation, the general objective was to include in each word segment of polysyllables the positional and marker grapheme clues for variant spelling-to-sound correspondences. Polysyllabic words containing minor spelling-to-sound correspondences were left unsegmented except for syllable-increasing inflectional endings and affixes.*

One typewriter space was inserted between word segments and two spaces inserted between words and between sentences. Arcs were placed over between-segment spaces to guard against a possibility that S's would confuse a word-

*For a complete list of major spelling-to-sound correspondences and detailed segmentation procedures see Simon (1971).

segment with a whole word. The following illustrates the typographical arrangement of segmented print:

> Be cause of Father's pa tience, and es pecial ly be cause of his con stant en courage ment, Mary and Dick were swim ming con fi dent ly be fore their sixth birth days.

The same reading selections were used in their original published form by the TERM-NSP group.

The 90 reading selections were recorded on tape cassettes by teachers, with a reading rate of approximately 125 words per minute.

Procedure

Each group was scheduled for instruction for five 40-minute periods per week. There were three classes of 15 pupils in the TERM-SP group and two classes of 15 in the TERM-NSP group. S's in the Control group were in several classes, all receiving the same diagnostic-prescriptive remedial reading program with experienced teachers.*

S's in the TERM-SP and TERM-NSP groups were seated in individual carrels equipped with cassette recorders and earphones. S's were given a brief training program to familiarize them with the operation of the recorder and with routines for obtaining and returning materials.

S's were instructed to listen to a recorded reading selection while simultaneously following the print silently. They then inserted a blank cassette into the recorder and taped an indicated portion of the reading

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* The SRR program in the school had been designated as an "Impact" program in the New York City Right-to-Read High School Project because of its superior record of effectiveness.

selection. S's listened to their own tapes to check for such oral reading errors as mispronunciations, substitutions, repetitions, disregard of punctuation, lack of expression, etc. If a S was not satisfied with his performance, he referred to the model tape and re-recorded his own reading. The procedure was followed until the entire selection was taped to the S's satisfaction. There was no check on comprehension.

One teacher and a paraprofessional served each group to distribute and collect materials and to encourage the maintenance of high standards of oral reading, but they gave no direct assistance in word-identification unless a pupil asked for help.

The S's in the Control group followed a diagnostic-prescriptive program in remedial reading in which teachers used a number of informal diagnostic instruments to pinpoint word-identification, vocabulary technique and comprehension deficiencies. A variety of instructional reading materials and workbooks keyed to skills needs was prescribed for each pupil based on the diagnostic findings. Pupils worked individually or in small groups under the supervision of a teacher and a paraprofessional. Each teacher in the Skills Remediation program had received in-service training as part of the Right-to Read program and had two or more years experience in the program.

At the end of a twelve-week period of instruction all S's in the study were re-tested with alternate forms of the Gilmore Oral Reading Test and the Metropolitan Reading Test.

Pre- and post-test protocols of the Gilmore Oral Reading Test were scored by the senior investigator without his knowledge of S's group-assignment. Non-standard Black and Hispanic dialect pronunciations were accepted, and scoring followed the directions in the test Manual.

To provide a check on scoring accuracy, a 20 per cent randomly selected sample of pre- and post-test protocols was independently scored by the head of the school's reading program. The incidence of inter-judge disagreement was minimal, and differences were resolved conservatively.

RESULTS

To test the hypothesis that the TERM-SP group would make the greatest gains in oral reading in a comparison with the TERM-NSP and control group, an analysis of variance was computed for mean gains in grade equivalent scores. Mean pre-, post-, and gain scores and standard deviations are presented in Table II.

TABLE II

ORAL READING: MEANS AND STANDARD DEVIATIONS

FOR PRE-, POST- AND GAIN SCORES (GRADE EQUIVALENTS)

Group	Pre-test		Post-test		Gains (in months)	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
TERM-SP	4.6	1.1	5.4	1.4	8.7	.9
TERM-NSP	5.0	1.1	5.6	1.4	6.4	.9
CONTROL	4.6	.8	4.8	.8	1.6	.5

The results of the analysis of variance for oral reading are presented in Table III.

TABLE III

ANALYSIS OF VARIANCE FOR ORAL READING GAINS

Source	SS		df	F	P
Total	46.84	--	65	--	--
Between group	5.87	2.94	2	4.51	.015
Within group	40.97	.65	63	--	--

Table II indicates that the TERM-SP group made a gain of 8.7 months in oral reading in twelve weeks of instruction. The gains for the TERM-NSP and C groups were 6.4 and 1.6 months respectively.

Table III indicates that the obtained F ration of 4.51 (df 2,63) is significant beyond the .02 level. A Scheffe comparison of means after the significant F indicated that a between-group difference of 5.9 months was required for significance at the .05 level. The obtained difference in gains between the TERM-SP and the control group was 7.1 months ($p < .05$). The difference in gains between the TERM-NSP and the control group was 4.8 months ($p > .05$). The hypothesis that the TERM-SP group would make the greatest gain among the three groups may therefore be retained.

To test the hypothesis that the TERM-SP group would make greater gains in reading comprehension than the TERM-NSP and control group, a one-way analysis of variance was computed for mean standard scores for Total Reading on the Metropolitan Reading Test. Table IV presents means and standard deviations for standard scores together with grade equivalents for pre-tests, post-tests and gains.

TABLE IV

TOTAL READING MEANS AND STANDARD DEVIATIONS FOR PRE-TESTS, POST-TESTS AND GAINS: STANDARD SCORES AND GRADE EQUIVALENTS

Group	Pre-test			Post-test			Gains		
	$\bar{X}$	SD	G.E.	$\bar{X}$	SD	G.E.	X	SD	G.E. (months)
TERM-SP	69.8	9.6	4.7	74.5	7.1	5.2	4.7	6.2	5.0
TERM-NSP	70.9	10.2	4.8	71.5	9.3	4.8	.5	9.1	---
CONTROL	75.6	8.3	4.9	76.2	9.0	5.3	.6	7.2	6.0

Table IV indicates that the TERM-SP group made a gain of 5.0 months in total reading . The TERM-NSP group showed no improvement over the instructional period, and the Control group made a gain of six months.

The results of the analysis of variance of standard scores for total reading are given in Table V.

TABLE V

ANALYSIS OF VARIANCE FOR TOTAL READING

Source	SS	MS	df	F	P
Total	3454.25	---	65	---	--
Between group	266.76	133.38	2	2.64	.08
Within group	3187.49	50.60	63	---	--

Table V shows that the obtained F ratio, 2.64 (df 2,63) is non-significant at the .05 level, indicating that there were no significant differences among the means for total reading. The hypothesis that the TERM-SP group would make the greatest gains in reading comprehension must therefore be rejected.

CONCLUSIONS AND DISCUSSION

The data from the present pilot study support a conclusion that a remedial reading program combining a taped echoic response method using segmented print material can be effective in improving oral reading. The crucial role of segmented print in the treatment is revealed by a design that provided control of a possible Hawthorne effect arising from the use of a novel procedure using tape recorders - a procedure that did not enable the TERM-NSP group to make significantly greater gains than a control group.

Although the present "quick and rough" pilot investigation did not attempt to assess their unique effects, there appear to be a number of variables within the experimental treatment that may have contributed to the significant gain in oral reading by the TERM-SP group.

1. The use of tape recorders, earphones and individual carrels provided Ss with a learning environment that minimized distractions and embarrassments from oral reading errors. It also provided Ss with opportunities for maximum concentration and active participation far beyond that usually prevailing in group oral reading instruction.

2. The combination of taped echoic responses and segmented print provided Ss with multi-sensory inputs of visual, auditory and vocal stimuli, thereby either intensifying the total stimulus or appealing to individually favored modes of learning.

3. The ego-enhancing effect of hearing one's own voice on tape and the motivation that comes from working to satisfy one's own standards of excellence should also be noted.

4. The master tapes provided Ss with intensive exposure to models of fluent, expressive oral readings of materials written in standard English for imitation. They also served to supply "prompts" as needed, with a tireless patience and consistency.

5. The instructional procedure for word-identification was within a context of whole language rather than by analysis of individual words, thus enabling Ss to utilize all the clues normally available in functional reading.

The retention of the general hypothesis that the experimental treatment would improve reading ability must, of course, be limited to the area of decoding, since there were no significant differences among the three groups in reading comprehension. It should be noted, however, that the

TERM-SP group made a gain of five months in total reading in approximately three months, a respectable improvement by any standard.

The failure of the TERM-NSP group to make any gain in total reading may possibly be construed as support for crucial nature of segmented print as a treatment variable. One may conjecture that, although the group made a gain of more than six months in oral reading as measured by the Gilmore Oral Reading Test, the improved scores were attributable to a reduction in such oral reading "errors" as repetitions and hesitations - fluency factors that taped echoic responses might most readily eliminate, leaving uncorrected the deficits in word-identification ability. Such errors, resulting in mispronunciations or omissions due to an inability to decode visually unfamiliar polysyllables, are more apt to interfere with reading comprehension. Further investigation is needed to assess possible changes in "error" patterns in oral reading resulting from various types of treatment and to determine possible relationships to reading comprehension.

Also requiring further investigation is the possibility that for significant improvement in comprehension to take place a yet-to-be-determined critical degree of improvement in oral reading ability must be achieved, especially when no instruction in reading comprehension is provided.

It should be noted that these conjectures, as well as the generalizations that are more directly supported by the data from the study are limited by the conditions inherent in the design. These include the duration of the instructional span of time, the entry level of Ss' reading ability, the readability and interest levels of the materials used and acceptable records of class attendance. No assumptions can be made about continued rates of improvement with extended treatment nor about retention of gains.

In addition to those raised above, there are a number of questions

that remain for future investigation;

1. Would a TERM-SP treatment be effective with other populations, such as poor readers in the middle grades, penal-connected subjects and adult illiterates?

2. Would the inclusion of comprehension checks and instruction improve reading comprehension gains?

3. Would the use of a TERM-SP treatment be effective in developing content knowledge in such fields as mathematics, science, social studies, etc.?

4. Do Ss retain oral reading gains after the TERM-SP treatment?

Replications of the study to extend the data base and further investigations of the experimental treatment appear to be warranted as we continue to seek answers to the problem of the poor reader.

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